

REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1, 3-12 and 15-22 are pending, with claims 1, 3, 6, 10-11, 15 and 22 amended, and claims 2 and 13-14 cancelled without prejudice or disclaimer by the present amendment. Claims 1 and 22 are independent.

In the Official Action, claims 19-20 were rejected under 35 U.S.C. § 112, second paragraph; claims 1, 16-18 and 22 were rejected under 35 U.S.C. § 102(b) as being anticipated by Hayakawa (U.S. Patent No. 5,580,822); claims 2 and 19-21 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hayakawa and Kutsunai (U.S. Patent Pub. No. 2001/0028074); claims 3-4 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hayakawa, Kutsunai and Okutani (U.S. Patent No. 5,135,608); claims 6, 10-13 and 15 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hayakawa, Kutsunai and Loan (U.S. Patent No. 6,136,725); claims 3-4 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hayakawa, Kutsunai, Okutani and Loan; and claim 14 was rejected under 35 U.S.C. § 103(a) as being obvious in view of Hayakawa, Kutsunai, Loan and Takada (JP 06-254416).

Claims 1 and 22 are amended to recite the features of claims 2 and 13-14. No new matter is added. Claims 3, 6, 10-11 and 15 are amended to maintain antecedent support. Support for this amendment is found in applicant's originally filed specification. No new matter is added.

In view of the incorporation of claims 2 and 13-14 into claims 1 and 22, the rejections of claims 1 and 22 are moot.

Briefly recapitulating, amended claim 1 is directed to

A plasma surface processing system for processing a surface of a metal material by forming plasma in a reaction chamber, comprising:

a supply device configured to supply a plasma processing solution into the reaction chamber as a liquid drop form, the supply device including

a processing solution reservoir configured to store the plasma processing solution as a hermetic state;

a carrier gas inflow pipe connected to the processing solution reservoir and configured to introduce a carrier gas, which carries liquid drops of the plasma processing solution, into the processing solution reservoir;

a supply pipe connecting the processing solution reservoir to the reaction chamber and configured to supply the carrier gas and the liquid drops of the plasma processing solution to the reaction chamber; and

a temperature control device provided with the processing solution reservoir and configured to control a temperature of the stored plasma processing solution, wherein the temperature control device includes:

a receiving tank configured to hold the processing solution reservoir and insulating oil,

a heater installed in the receiving tank, and

a cooling device installed in the receiving tank.

Claim 22 recites, *inter alia*, a supply device configured to supply a plasma processing solution into the reaction chamber in a liquid drop form.

Hayakawa describes a CVD method for forming a deposited film on a substrate including: evacuating the inside of a reaction chamber; supporting a substrate in the reaction chamber; and feeding a gaseous starting material into the reaction chamber using a gas feeding device. The gas feeding device includes a container that holds a liquid starting material, a pressure reducing device that reduces the pressure inside said container, and a heater that heats and boils the starting material to form said gaseous starting material.

However, contrary to the Official Action, Hayakawa does not disclose or suggest a supply device configured to supply a plasma processing solution into the reaction chamber *as a liquid drop form*. FIG. 7 of Hayakawa is a graph that shows the relationship between the temperature inside the rectifier 2003 and the feed efficiency of the starting gas formed by evaporation. When DMAH is used as the liquid starting material, the liquid starting material is evaporated by substantially 100% *if the temperature inside the rectifier is not higher than 100°C and not lower than 40°C*, and fed into the reaction chamber. *If the temperature is lower than 40°C, the material tends to be incompletely evaporated to remain as liquid droplets in the rectifier*. If the temperature is higher than 100°C, about 0.1% of the starting gas undergoes decomposition inside the rectifier to cause deposition of Al. The Al deposited there may cause clogging of openings of a quartz plate to prohibit flow of the starting gas, resulting in a great decrease in feed efficiency for the rate of decomposition of as small as 0.1%.

Thus, rather than supplying a plasma processing solution into the reaction chamber as a liquid drop form, Hayakawa discloses maintaining the temperature between 100°C and 100°C to avoid droplets. Because Hayakawa explains which temperatures are to be used to avoid droplets, Hayakawa actually teaches away from Applicant's claimed invention.

MPEP § 2131 notes that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See also MPEP § 2131.02. "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Because Hayakawa does not disclose or suggest

all of the features recited in claims 1 and 22, Hayakawa does not anticipate the invention recited in claims Hayakawa, and all claims depending therefrom.

Applicant has considered the remaining applied references and submits these references do not cure the deficiencies of Hayakawa. As none of the cited art, individually or in combination, discloses or suggests at least the above-noted features of independent claims 1 and 22, Applicant submits the inventions defined by claims 1 and 22, and all claims depending therefrom, are not rendered obvious by the asserted references for at least the reasons stated above.¹ Indeed, MPEP § 2141.02 notes that the prior art must be considered in its entirety, including disclosures that teach away from the claims. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). MPEP § 2145 notes that it is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

Furthermore, contrary to the Official Action relative to now-cancelled claim 14, Takada does not disclose or suggest a cooling device installed in a receiving tank. The cooling pipe 6 of Takada is not installed in any receiving tank, let alone a receiving tank having configured to hold the processing solution reservoir in insulating oil and having both a cooling device and a heater installed therein. Thus, for a second reason, claims 1 and 22 patentably define over the applied references.

¹ MPEP § 2142 "...the prior art reference (or references when combined) must teach or suggest **all** the claim limitations.

REMARKS

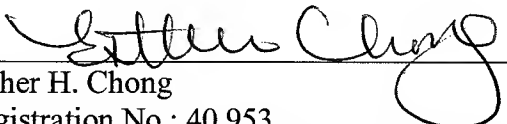
In view of the above amendment, applicant believes the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Esther H. Chong, Reg. No. 40,953, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By 

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